

WHAT IS CLAIMED IS:

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1. An information processing apparatus
comprising:

storage means for storing printing data to which a
5 printing attribute has been added;

contour information extraction means for
extracting contour information for said printing data
based on said printing attribute added to said printing
data that are stored in said storage means;

10 layout reference information setting means for
employing said contour information, extracted by said
contour information extraction means, to determine
layout reference information to be used as a reference
when laying out said printing data; and

15 layout means for laying out said printing data
based on said information determined by said layout
reference information setting means.

2. An information processing apparatus according
20 to claim 1, wherein said layout reference information
consists of a layout reference point and a layout
reference size.

3. An information processing apparatus according
25 to claim 1, wherein said layout means designates the
layout position for and the size of said printing data.

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4. An information processing apparatus according to claim 1, further comprising:

display means for displaying printing data, stored in said storage means, that is based on printing attributes that are added to said printing data,

wherein said contour information extraction means employs the resolution of said display means to extract contour information for said printing data displayed on said display means.

5. An information processing apparatus according to claim 1, further comprising:

display means for displaying printing data, stored in said storage means, that is based on printing attributes that are added to said printing data;

printing means for printing printing data stored in said storage means in accordance with printing attributes added to said printing data;

enlargement means for enlarging said printing data and displaying the enlarged printing data on said display means; and

reduction means for reducing said printing data and displaying the reduced printing data on said display means,

wherein said enlargement means employs a difference in the resolutions between said display means and said printing means to display said enlarged

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printing data on said display means,

wherein said contour information extraction means employs the resolution of said display means to extract contour information for said printing data displayed on said display means, and

wherein, after said contour information is extracted by said contour information extraction means, said reduction means reduces said enlarged printing data to the original size, and displays the resultant printing data.

6. An information processing apparatus according to claim 1, wherein, based on said printing attributes added to said printing data stored in said storage means, said contour information extraction means performs geometrical calculations using said printing data, and extracts said contour information for said printing data.

7. An information processing apparatus according to claim 1, further comprising:

printing means for printing printing data, stored in said storage means, in accordance with printing attributes added to said printing data,

wherein said contour information extraction means outputs said printing data in said storage means to a hardware or a software component that emulates said

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printing means and provides a resolution corresponding to that provided by said printing means, and wherein said contour information means employs the results obtained in this fashion to extract said contour information for said printing data.

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8. An information processing apparatus according to claim 1, wherein, when said printing data are graphic data, said layout reference information setting means sets said layout reference information based on the smallest rectangle that is to be employed to enclose a visible portion of said printing data.

9. An information processing apparatus according to claim 1, wherein, when said printing data are character data said layout reference information setting means sets said layout reference information based on the height of a visible portion of a predetermined reference character and the width of a visible portion of said printing data.

10. An information processing apparatus according to claim 1, further comprising:

layout reference information addition means for adding, to said printing data, said layout reference information that is set by said layout reference information setting means.

11. An information processing apparatus according to claim 1, further comprising:

layout reference information display means for displaying, together with said printing data, said layout reference information that is set by said layout reference information setting means.

12. An information processing apparatus according to claim 1, wherein said printing data includes character/graphic data and data for a dragonfly that is used as a positioning mark when printing said character/graphic data.

13. An information processing apparatus according to claim 12, wherein said layout means lays out said dragonfly based on the smallest rectangle that encloses a visible portion of said character/graphic data.

14. An information processing apparatus according to claim 12, wherein said layout means lays out a dragonfly having a dragonfly shape that is selected from among a plurality of dragonfly shapes.

15. An information processing apparatus according to claim 14, further comprising:

offset setting means for determining whether said dragonfly is to be offset,

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wherein said layout means lays out said dragonfly in accordance with the contents set up by said offset setting means and with said dragonfly shape that is selected.

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16. An information processing apparatus according to claim 1, further comprising:

code data input means for entering code data,

wherein said printing data are bar code data that consist of a plurality of bars having different widths, and

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wherein said layout means lays out said bar code by using said code data that are entered by said code data input means.

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17. An information processing apparatus according to claim 16, wherein said layout means lays out a bar code that corresponds to a bar code type selected from among a plurality of standard bar code types.

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18. An information processing apparatus according to claim 16, further comprising:

checking means for determining whether said code data entered by said code data input means conforms to the standards for said bar code type that is selected.

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19. An information processing apparatus according

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to claim 16, further comprising:

designation means for instructing the laying out,
together with said bar code, of said code data entered
by said code data input means,

5 wherein, when said designation means instructs the
laying out of said code data together with said bar
code, said layout means lays out said code data with
said bar code.

20. An information processing apparatus according
to claim 1, further comprising:

first and second printing means that have
different printing resolutions;

15 selection means for selecting either said first or
said second printing means; and

print control means for permitting said printing
means selected by said selection means to print said
printing data.

20 21. An information processing apparatus according
to claim 20, further comprising:

25 additional printing information setting means for
setting, for said printing means selected by said
selection means, additional printing information that
is required when printing said printing data,

wherein said print control means controls the
printing of said printing data in accordance with said

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additional printing information that is set by said additional printing information setting means.

5 22. An information processing apparatus according to claim 1, further comprising:

printing means for printing a plurality of printing data sets; and

10 printing data optimal arrangement means for optimally arranging said plurality of printing data sets on a printing sheet before said printing data sets are collectively printed by said printing means.

5.5 A1 > 23. An information processing apparatus according to claim 1, further comprising:

15 printing data input means for entering said printing data received from an external information processing apparatus together with printing attributes that are added to said printing data.

20 24. An information processing apparatus according to claim 1, further comprising:

25 graphic data input means for receiving basic or reference graphic data from an external information processing apparatus before said layout means lays out said printing data.

5.5 A1 > 25. An information processing apparatus according

to claim 1, further comprising:

printing data output means for outputting said printing data, together with said printing attributes, to an external information processing apparatus.

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26. An information processing apparatus according to claim 1, further comprising:

printing data output means for deleting said printing attributes in said printing data, or for converting said printing data to provide a form corresponding to the data employed by an external information processing apparatus, and for outputting the resultant printing data to said external information processing apparatus.

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27. An information processing apparatus according to claim 1, further comprising:

printing data selection means for selecting a plurality of printing data sets; and

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grouping means for assembling into a single data set group said plurality of printing data sets that are selected by said printing data selection means.

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28. An information processing apparatus according to claim 27, further comprising:

group data storage means for storing said group data obtained by said grouping means;

5 control means for, even when said retrieved group
data is changed by said change means, inhibiting the
changing of group data stored in said group data
storage means.

control means for changing group data stored in
said storage means in synchronization with the changing
20 of said retrieved group data by said change means.

instruction means for instructing an arbitrary

time in the past; and

reflection means for reflecting, relative to
printing data that include said group data, said
history stored in said history storage means at said
5 time that is instructed by said instruction means.

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10 31. An information processing method comprising:
a contour information extraction step of
extracting contour information for printing data based
on a printing attribute that has been added to said
printing data stored in storage means;

15 a layout reference information setting step of
employing said contour information, extracted at said
contour information extraction step, to determine
layout reference information to be used as a reference
when laying out said printing data; and

20 a layout step of laying out said printing data
based on said information determined at said layout
reference information setting step.

25 32. An information processing method according to
claim 31, wherein said layout reference information
consists of a layout reference point and a layout
reference size.

33. An information processing method according to
claim 31, wherein the layout position for and the size

of said printing data are designated at said layout step.

5 34. An information processing method according to claim 31, for an information processing apparatus comprising display means for displaying printing data, stored in said storage means, that is based on printing attributes that are added to said printing data, wherein, at said contour information extraction step,
10 the resolution of said display means is employed to extract contour information for said printing data displayed on said display means.

15 35. An information processing method according to claim 31, for an information processing apparatus that comprises:

display means, for displaying printing data, stored in said storage means, that is based on printing attributes that are added to said printing data; and

20 printing means for printing printing data stored in said storage means in accordance with printing attributes added to said printing data,

wherein a difference in the resolutions between said display means and said printing means is employed
25 to display said enlarged printing data on said display means,

wherein, at said contour information extraction

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step, the resolution of said display means is employed to extract contour information for said printing data displayed on said display means, and

5 wherein, after said contour information is extracted at said contour information extraction step, said enlarged printing data are reduced to the original size, and the resultant printing data are displayed.

36. An information processing method according to
10 claim 31, wherein, at said contour information extraction step, based on said printing attributes added to said printing data stored in said storage means, geometrical calculations are performed using
15 said printing data, and said contour information is extracted for said printing data.

37. An information processing method according to
claim 31, for an information processing apparatus
comprising printing means for printing printing data,
20 stored in said storage means, in accordance with printing attributes added to said printing data,

wherein, at said contour information extraction step, said printing data in said storage means are output to a hardware or a software component that
25 emulates said printing means and provides a resolution corresponding to that provided by said printing means, and wherein, at said contour information step, the

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results obtained in this fashion is employed to extract said contour information for said printing data.

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38. An information processing method according to claim 31, wherein, when said printing data are graphic data, at said layout reference information setting step, said layout reference information is set based on the smallest rectangle that is to be employed to enclose a visible portion of said printing data.

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39. An information processing method according to claim 31, wherein, when said printing data are character data, at said layout reference information setting step, said layout reference information is set based on the height of a visible portion of a predetermined reference character and the width of a visible portion of said printing data.

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40. An information processing method according to claim 31, further comprising:

a layout reference information addition step of adding, to said printing data, said layout reference information that is set at said layout reference information setting step.

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41. An information processing method according to claim 31, further comprising:

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a layout reference information display step of displaying, together with said printing data, said layout reference information that is set at said layout reference information setting step.

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42. An information processing method according to claim 31, wherein said printing data includes character/graphic data and data for a dragonfly that is used as a positioning mark when printing said character/graphic data.

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43. An information processing method according to claim 42, wherein, at said layout step, said dragonfly is laid out based on the smallest rectangle that encloses a visible portion of said character/graphic data.

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44. An information processing method according to claim 42, wherein, at said layout step, a dragonfly is laid out, which has a dragonfly shape that is selected from among a plurality of dragonfly shapes.

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45. An information processing method according to claim 44, comprising:

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an offset setting step of determining whether said dragonfly is to be offset,
wherein, at said layout step, said dragonfly is

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laid out in accordance with the contents set up at said offset setting step and with said dragonfly shape that is selected.

5 46. An information processing method according to claim 31, further comprising:

a code data input step of entering code data,
wherein said printing data are bar code data that consist of a plurality of bars having different widths,
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wherein, at said layout step, said bar code is laid out by using said code data that are entered at said code data input step.

15 47. An information processing method according to claim 46, wherein, at said layout step, a bar code is laid out that corresponds to a bar code type selected from among a plurality of standard bar code types.

20 48. An information processing method according to claim 46, further comprising:

a checking step of determining whether said code data entered at said code data input step conforms to the standards for said bar code type that is selected.

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49. An information processing method according to claim 46, further comprising:

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a designation step of instructing the laying out, together with said bar code, of said code data entered at said code data input step,

5 wherein, when the laying out of said code data together with said bar code is instructed at said designation step, said code data is laid out with said bar code at said layout step.

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10 50. An information processing method according to claim 31, for an information processing apparatus comprising first and second printing means that have different printing resolutions, further comprising:

a selection step of selecting either said first or said second printing means; and

15 a print control step of permitting said printing means selected at said selection step to print said printing data.

20 51. An information processing method according to claim 50, further comprising:

an additional printing information setting step of setting, for said printing means selected at said selection step, additional printing information that is required when printing said printing data,

25 wherein, at said print control step, the printing of said printing data is controlled in accordance with said additional printing information that is set at

said additional printing information setting step.

52. An information processing method according to claim 31, for an information processing apparatus including printing means for printing a plurality of printing data sets, further comprising:

a printing data optimal arrangement step of optimally arranging said plurality of printing data sets on a printing sheet before said printing data sets are collectively printed by said printing means.

53. An information processing method according to claim 31, further comprising:

a printing data input step of entering said printing data received from an external information processing apparatus together with printing attributes that are added to said printing data.

54. An information processing method according to claim 31, further comprising:

a graphic data input step of receiving basic or reference graphic data from an external information processing apparatus before said printing data is laid out at said layout step.

55. An information processing method according to claim 31, further comprising:

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a printing data output step of outputting said printing data, together with said printing attributes, to an external information processing apparatus.

5 56. An information processing method according to claim 31, further comprising:

10 a printing data output step of deleting said printing attributes in said printing data, or for converting said printing data to provide a form corresponding to the data employed by an external information processing apparatus, and of outputting the resultant printing data to said external information processing apparatus.

15 57. An information processing method according to claim 31, further comprising:

55 A1 > a printing data selection step of selecting a plurality of printing data sets; and

20 a grouping step of assembling into a single data set group said plurality of printing data sets that are selected at said printing data selection step.

25 58. An information processing method according to claim 57, for an information processing apparatus including group data storage means for storing said group data obtained at said grouping step, further comprising:

a retrieval step of retrieving said group data from said group data storage means;

a change step of changing said group data that is retrieved at said retrieval step; and

5 a control step of, even when said retrieved group data is changed at said change step, inhibiting the changing of group data stored in said group data storage means.

10 59. An information processing method according to claim 57, for an information processing apparatus including group data storage means for storing said group data obtained at said grouping step, further comprising:

15 a retrieval step of retrieving said group data from said group data storage means;

a change step of changing said group data that is retrieved at said retrieval step; and

20 a control step of changing group data stored in said storage means in synchronization with the changing of said retrieved group data at said change step.

60. An information processing method according to claim 59, further comprising:

25 a history storage step of storing a history, for group data stored in said group data storage means, each time said group data is changed;

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an instruction step of instructing an arbitrary time in the past; and

5 a reflection step of reflecting, relative to printing data that include said group data, said history stored in said history storage means at said time that is instructed at said instruction step.

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10 61. A storage medium, which is readable by a computer and on which a computer program is stored, said computer program comprising:

a contour information extraction module for extracting contour information for printing data based on a printing attribute added to said printing data;

15 a layout reference information setting module for employing said contour information, extracted by said contour information extraction means, to determine layout reference information to be used as a reference when laying out said printing data; and

20 a layout module for laying out said printing data based on said information determined by said layout reference information setting means.

25 62. A storage medium according to claim 61, wherein, based on the resolution of a display means for displaying printing data in accordance with printing attributes that are added to said printing data, said contour information extraction module employs the

resolution of said display means to extract contour information for said printing data displayed on said display means.

5 63. A storage medium according to claim 61, further comprising an enlargement module and a reduction module,

 wherein said enlargement module enlarges said printing data and displays the resultant data on said
10 display means in accordance with a difference between the resolution of said display means, for displaying said printing data in accordance with said printing attributes that are added to said printing data, and the resolution of said printing means, for printing
15 said printing data in accordance with said printing attributes that are added to said printing data,

 wherein said contour information extraction module employs the resolution of said display means to extract
contour information for said printing data displayed on
20 said display means, and

 wherein, after said contour information is extracted by said contour information extraction module, said reduction module reduces said enlarged printing data into the original size and displays the
25 resultant printing data.

64. A storage medium according to claim 61,

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wherein said printing data includes character/graphic data and data for a dragonfly that is used as a positioning mark when printing said character/graphic data.

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65. A storage medium according to claim 61, said program further comprising:

a code data input module for entering code data, wherein said printing data are bar code data that consist of a plurality of bars having different widths, and

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wherein said layout module lays out said bar code by using said code data that are entered by said code data input module.

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66. An information processing apparatus comprising:

determination means for determining an output destination for a reverse video element for which a reverse video attribute is set;

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acquisition means for obtaining a background color, for said output destination, determined by said determination means; and

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output color setting means for designating for said reverse video element a color that differs from said background color obtained by said acquisition means.

67. An information processing apparatus according to claim 66, further comprising:

output means for employing said color determined by said output color setting means to paint said reverse video element a solid color and to display the resultant solid color element.

68. An information processing apparatus according to claim 66, further comprising:

output means for employing said color determined by said output color setting means to display the contour of said reverse video element.

69. An information processing apparatus according to claim 66, further comprising:

attribute setting means for setting a reverse video attribute for desired character data or solid color graphic data and to regard said data as said reverse video element.

70. An information processing apparatus according to claim 66, wherein, when said determination means determines that an output destination is a display device, said output color setting means sets for said reverse video element a color different from said background color.

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71. An information processing apparatus according to claim 66, wherein, when said determination means determines that an output destination is a display device, said output color setting means sets, as an output color for said reverse video element, a color different from said background color that is obtained by said acquisition means, and outputs said reverse video element; and wherein, when said determination means determines that an output destination is a printer, said output color setting means sets, as an output color for said reverse video element, the same color as said background color, and outputs said reverse video element.

72. An information processing apparatus according to claim 66, wherein said output color setting means includes:

analysis means for analyzing said background color and extracting the color elements hue, brightness and saturation;

correction means for correcting said color elements; and

synthesis means for synthesizing a new output color by using the corrected color elements,

wherein said output color obtained by said synthesis means is determined to be a color for painting said reverse video element a solid color.

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search means for searching for a solid color graphic pattern that overlaps a character string or a graphic pattern for which a reverse video attribute is set;

5 area calculation means for calculating an area wherein said reverse video element overlaps said solid color graphic pattern that is found by said search means; and

10 pattern color acquisition means for obtaining the color of said solid color graphic pattern that is found by said search means,

15 wherein said correction coefficient is calculated by using said color obtained by said pattern color acquisition means and said area calculated by said area calculation means.

20 77. An information processing apparatus according to claim 76, wherein said pattern color acquisition means acquires a color for a solid color graphic pattern that has the largest area of those obtained by said area calculation means; and wherein said correction coefficient is calculated based on said color obtained by said pattern color acquisition means.

25 78. An information processing apparatus according to claim 75, wherein said correction means calculates a distance between a first color, which is obtained by

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correcting said background color using a predetermined correction coefficient, and a second color, which is employed for a solid color graphic pattern that is the background for said reverse video element; and wherein, when said distance is equal to or smaller than a predetermined value, said correction means corrects said background color by using said correction coefficient obtained by said correction coefficient calculation means.

79. An information processing apparatus according to claim 66, wherein said reverse video element is a character string or a graphic pattern for which said reverse video attribute is designated.

80. An information processing apparatus comprising:

determination means for determining whether a specific display object element for which a temporarily specific display process is to be performed is a reverse video element for which a reverse video attribute is designated;

first setting means for, when said determination means ascertains that said specific display object element is not a reverse video element, setting an ordinary specific display color for said specific display object element; and

second setting means for, when said determination means ascertains that said specific display object element is a reverse video element, setting for said specific display object element a color that differs
5 from said specific display color.

81. An information processing apparatus according to claim 80, further comprising:

specific display determination means for
10 determining whether a display object element is a specific display object element for which a temporarily specific display process is to be performed.

82. An information processing apparatus according to claim 80, further comprising:

output means for painting said reverse video element a solid color using said color that is designated by said second setting means.

83. An information processing apparatus according to claim 80, further comprising:

output means for displaying the contour of said reverse video element using said color that is designated by said second setting means.

84. An information processing apparatus according to claim 80, further comprising:

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attribute setting means for setting a reverse video attribute for desired character data or solid color graphic data and to regard said data as a reverse video element.

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85. An information processing apparatus according to claim 80, wherein said reverse video element is a character string or a graphic pattern for which said reverse video element is designated.

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86. An information processing method comprising:
a determination step of determining an output destination for a reverse video element for which a reverse video attribute is set;

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an acquisition step of obtaining the background color at said output destination, which was determined at said determination step; and

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an output color setting step of designating for said reverse video element a color that differs from said background color obtained at said acquisition step.

87. An information processing method according to claim 86, further comprising:

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an output step of employing said color determined at said output color setting step to paint said reverse video element a solid color and to display the

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resultant solid color element.

88. An information processing method according to claim 86, further comprising:

5 an output step of employing said color determined at said output color setting step to display the contour of said reverse video element.

10 89. An information processing method according to claim 86, further comprising:

an attribute setting step of setting a reverse video attribute for desired character data or solid color graphic data and to regard said data as said reverse video element.

15 90. An information processing method according to claim 86, wherein, when it is ascertained that said determination step that an output destination is a display device, a color different from said background color is set for said reverse video element at said output color setting step.

25 91. An information processing method according to claim 86, wherein, when it is ascertained at said determination step that an output destination is a display device, at said output color setting step, a color different from said background color that is

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obtained at said acquisition step is set as an output color for said reverse video element, and said reverse video element is output; and wherein, when it is ascertained at said determination step that an output destination is a printer, at said output color setting step, the same color as said background color is set as an output color for said reverse video element, and said reverse video element is output.

92. An information processing method according to claim 86, wherein said output color setting step includes:

an analysis step of analyzing said background color and extracting the color elements hue, brightness and saturation;

a correction step of correcting said color elements; and

a synthesis step of synthesizing a new output color by using the corrected color elements,

wherein said output color obtained at said synthesis step is determined to be a color for painting said reverse video element a solid color.

93. An information processing method according to claim 92, wherein at said correction step, said color elements are corrected by multiplying, by a predetermined correction coefficient, said brightness

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element that is extracted at said analysis step.

5 94. An information processing method according to claim 92, wherein at said correction step, said color elements are corrected by multiplying, by a predetermined correction coefficient, said saturation element that is extracted at said analysis step.

10 95. An information processing method according to claim 92, wherein said correction step includes a correction coefficient calculation step of calculating said correction coefficient using the color of a solid color graphic pattern that is arranged as a background for said reverse video element; and wherein at said
15 correction step, said coefficient correction that is acquired at said correction coefficient calculation step is employed to correct the values of said color elements that are extracted at said analysis step.

20 96. An information processing method according to claim 94, wherein said correction coefficient calculation step includes:

25 a search step of searching for a solid color graphic pattern that overlaps a character string or a graphic pattern for which a reverse video attribute is set;

an area calculation step of calculating an area

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wherein said reverse video element overlaps said solid color graphic pattern that is found at said search step; and

5 a pattern color acquisition step of obtaining the color of said solid color graphic pattern that is found at said search step,

10 wherein said correction coefficient is calculated by using said color obtained at said pattern color acquisition step and said area calculated at said area calculation step.

15 97. An information processing method according to claim 96, wherein at said pattern color acquisition step, a color is acquired for a solid color graphic pattern that has the largest area of those obtained at said area calculation step; and wherein said correction coefficient is calculated based on said color obtained at said pattern color acquisition step.

20 98. An information processing method according to claim 95, wherein at said correction step, a distance is calculated between a first color, which is obtained by correcting said background color using a predetermined correction coefficient, and a second
25 color, which is employed for a solid color graphic pattern that is the background for said reverse video element; and wherein, when said distance is equal to or

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smaller than a predetermined value, at said correction step, said background color is corrected by using said correction coefficient obtained at said correction coefficient calculation step.

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99. An information processing method according to claim 86, wherein said reverse video element is a character string or a graphic pattern for which said reverse video attribute is designated.

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100. An information processing method comprising:
a determination step of determining whether a specific display object element for which a temporarily specific display process is to be performed is a reverse video element for which a reverse video attribute is designated;

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a first setting step of, when it is ascertained at said determination step that said specific display object element is not a reverse video element, setting an ordinary specific display color for said specific display object element; and

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a second setting step of, when it is ascertained at said determination step that said specific display object element is a reverse video element, setting for said specific display object element a color that differs from said specific display color.

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101. An information processing method according to claim 100, further comprising:

5 a specific display determination step of determining whether a display object element is a specific display object element for which a temporarily specific display process is to be performed.

102. An information processing method according to claim 100, further comprising:

10 an output step of painting said reverse video element a solid color using said color that is designated at said second setting step.

103. An information processing method according to claim 100, further comprising:

15 an output step of displaying the contour of said reverse video element using said color that is designated at said second setting step.

20 104. An information processing method according to claim 100, further comprising:

25 an attribute setting step of setting a reverse video attribute for desired character data or solid color graphic data and to regard said data as a reverse video element.

105. An information processing method according

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to claim 100, wherein said reverse video element is a character string or a graphic pattern for which said reverse video element is designated.

5 106. A storage medium in which is stored a control program for permitting a computer to display a graphic or a character pattern, said control program comprising:

10 code for a determination step of determining an output destination for a reverse video element for which a reverse video attribute is set;

 code for an acquisition step of obtaining the background color at said output destination, which was determined at said determination step; and

15 code for an output color setting step of designating for said reverse video element a color that differs from said background color obtained at said acquisition step.

20 107. A storage medium in which is stored a control program for permitting a computer to display a graphic or a character pattern, said control program comprising:

25 code for a determination step of determining whether a specific display object element for which a temporarily specific display process is to be performed is a reverse video element for which a reverse video

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attribute is designated;

code for a first setting step of, when it is
ascertained at said determination step that said
specific display object element is not a reverse video
5 element, setting an ordinary specific display color for
said specific display object element; and

code for a second setting step of, when it is
ascertained at said determination step that said
specific display object element is a reverse video
10 element, setting for said specific display object
element a color that differs from said specific display
color.

108. An information processing apparatus
15 comprising:

storage means for storing character data to which
a printing attribute has been added;

holding means for holding, for a specific
character, information for a position in a character
20 pattern body;

extraction means for employing said printing
attribute, which has been added to said character data
stored in said storage means, to extract body
information for characters, or a character string that
25 is represented by said character data;

position designation means for designating the
location of said specific character in the characters

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or in a character string that is to be laid out; and

layout means for, when said specific character in said characters or in said character string is located at said position designated by said position

5 designation means, employing said body information and said information for a position in a character pattern body to determine the head position of a body that corresponds to said characters or said character string, and for laying out said character string.

10 109. An information processing apparatus according to claim 108, further comprising:

specific character setting means for setting a desired character as said specific character.

15 110. An information processing apparatus according to claim 108, wherein said information for a position in a character pattern body, which is stored in said holding means, represents the arrangement of
20 said specific character in said character pattern body in accordance with a predetermined printing attribute.

111. An information processing apparatus according to claim 110, wherein said layout means
25 includes:

first calculation means for, when said extraction means obtains body information for a prepositive

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character string that extends from the head character
of a character string that is represented by said
character data to the character preceding said specific
character, calculating the size of the body of said
5 prepositive character string;

second calculation means for employing said
information for a position in a character pattern body
and a printing attribute to calculate information
concerning the position of said specific character in
10 said body; and

third calculation means for employing information
obtained by said first and said second calculation
means to calculate the head position of a pertinent
character string for which a predetermined portion of
15 said specific character is arranged at a position
designated by said position designation means,

wherein said character string is laid out at said
head position obtained by said third calculation means.

20 112. An information processing apparatus
according to claim 111, further comprising:

portion designation means for specifying said
predetermined portion of said specific character that
is used by said third calculation means.

25 113. An information processing apparatus
according to claim 111, wherein said second calculation

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means includes:

storage means for storing, for each typeface, a parameter for a predetermined printing attribute to represent the relationship between a circumscribed rectangle for a character and a body,

wherein said printing attribute added to said specific character and said parameter stored in said storage means are employed to calculate, for said specific character, said body information and said information for a position in said character pattern body.

114. An information processing apparatus according to claim 110, further comprising:

specific character search means for searching for said specific character in said character string that is to be laid out.

115. An information processing apparatus according to claim 108, wherein said information for the position of said specific character in the character pattern body, which is stored in said holding means, represents a position in the body of a circumscribed rectangle for the contour of said specific character.

116. An information processing apparatus

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according to claim 108, wherein said layout means includes:

first calculation means for calculating a circumscribed rectangle of a partial character string that extends from the head character of a character string, which is represented by said character data, to said specific character;

second calculation means for permitting said extraction means to extract body information for said partial character string, and for calculating the positional relationship between the body of said partial character string and said circumscribed rectangle obtained by said first calculation means; and

character string start position calculation means for employing said body information and said positional relationship between said body information and said circumscribed rectangle, which are obtained by said second calculation means, to determine the head position of said body of said partial character string for which said predetermined portion of said specific character is arranged at said position specified by said position designation means.

117. An information processing apparatus according to claim 108, wherein said holding means includes:

circumscribed rectangle extraction means for

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extracting character contour information in consonance
with a predetermined printing attribute for a character
that is determined as a specific character and for
extracting a circumscribed rectangle for said
5 character; and

arrangement information calculation means for
calculating information for a position in a character
body that represents the positional relationship
between the body of said character and said
10 circumscribed rectangle extracted by said circumscribed
rectangle extraction means,

wherein said information for a position in a
character body, which is obtained by said arrangement
information calculation means, is stored in association
15 with said specific character.

118. An information processing apparatus
according to claim 117, wherein said holding means
activates said circumscribed rectangle extraction means
20 and said arrangement information calculation means for
preparing a plurality of typefaces, and holds, for each
typeface, the information obtained for a position in a
character body.

119. An information processing apparatus
according to claim 117, wherein said holding means
activates said circumscribed rectangle extraction means

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and said arrangement information calculation means for a typeface that is frequently employed, and holds, for each typeface, the information obtained for a position in a character body.

5

120. An information processing method comprising:
a storage step of storing in a memory character data to which a printing attribute has been added;

10 a holding step of holding in-body location information for the character pattern of a specific character;

an extraction step of employing said printing attribute that is added to said character data stored in said memory to extract body information for
15 characters or for a character string that is represented by said character data;

a position designation step of designating the location of said specific character in characters or in a character string to be laid out; and

20 a layout step of, when said specific character in said characters or in said character string is located at said position designated at said position designation step, employing said body information and said in-body location information to determine the head
25 position of a body that corresponds to said characters or to said character string, and of laying out said character string.

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121. An information processing method according to claim 120, further comprising:

a specific character setting step of setting a desired character as said specific character.

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122. An information processing method according to claim 120, wherein said information for a position in a character pattern body, which is stored in a memory at said holding step, represents the arrangement of said specific character in said character pattern body in accordance with a predetermined printing attribute.

10

123. An information processing method according to claim 122, wherein said layout step includes:

15

a first calculation step of, when at said extraction step body information is obtained for a prepositive character string that extends from the head character of a character string that is represented by said character data to the character preceding said specific character, calculating the size of the body of said prepositive character string;

20

a second calculation step of employing said information for a position in a character pattern body and a printing attribute to calculate information concerning the position of said specific character in said body; and

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a third calculation step of employing information obtained at said first and said second calculation steps to calculate the head position of a pertinent character string for which a predetermined portion of said specific character is arranged at a position designated at said position designation step,

wherein said character string is laid out at said head position obtained at said third calculation step.

124. An information processing method according to claim 123, further comprising:

a portion designation step of specifying said predetermined portion of said specific character that is used at said third calculation step.

125. An information processing method according to claim 123, wherein said second calculation step includes:

a storage step of storing, for each typeface, a parameter for a predetermined printing attribute to represent the relationship between a circumscribed rectangle for a character and a body,

wherein said printing attribute added to said specific character and said parameter stored at said storage step are employed to calculate, for said specific character, said body information and said information for a position in said character pattern

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body.

126. An information processing method according to claim 122, further comprising:

5 a specific character search step of searching for said specific character in said character string that is to be laid out.

10 127. An information processing method according to claim 120, wherein said information for the position of said specific character in the character pattern body, which is stored at said holding step, represents a position in the body of a circumscribed rectangle for the contour of said specific character.

15 128. An information processing method according to claim 120, wherein said layout step includes:

20 a first calculation step of calculating a circumscribed rectangle of a partial character string that extends from the head character of a character string, which is represented by said character data, to said specific character;

25 a second calculation step of permitting, at said extraction step, extraction of body information for said partial character string, and calculation of the positional relationship between the body of said partial character string and said circumscribed

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rectangle obtained at said first calculation step; and
a character string start position calculation step
of employing said body information and said positional
relationship between said body information and said
5 circumscribed rectangle, which are obtained at said
second calculation step, to determine the head position
of said body of said partial character string for which
said predetermined portion of said specific character
is arranged at said position specified at said position
10 designation step.

129. An information processing method according
to claim 120, wherein said holding step includes:

a circumscribed rectangle extraction step of
15 extracting character contour information in consonance
with a predetermined printing attribute for a character
that is determined as a specific character and for
extracting a circumscribed rectangle for said
character; and

20 an arrangement information calculation step of
calculating information for a position in a character
body that represents the positional relationship
between the body of said character and said
circumscribed rectangle extracted at said circumscribed
25 rectangle extraction step,

wherein said information for a position in a
character body, which is obtained at said arrangement

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information calculation step, is stored in a memory in association with said specific character.

130. An information processing method according to claim 129, wherein, at said holding step, said circumscribed rectangle extraction step and said arrangement information calculation step are activated for preparing a plurality of typefaces, and, for each typeface, the information obtained for a position in a character body is stored in a memory.

131. An information processing method according to claim 129, wherein at said holding step, said circumscribed rectangle extraction step and said arrangement information calculation step are activated for a typeface that is frequently employed, and for each typeface, the information obtained for a position in a character body is held in a memory.

132. A storage medium in which is stored a control program for permitting a computer to arrange a character pattern, said control program comprising:

code for a storage step of storing in a memory character data to which a printing attribute has been added;

code for a holding step of holding in-body location information for the character pattern of a

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specific character;

code for an extraction step of employing said
printing attribute that is added to said character data
stored in said memory to extract body information for
5 characters or for a character string that is
represented by said character data;

code for a position designation step of
designating the location of said specific character in
characters or in a character string to be laid out; and

10 code for a layout step of, when said specific
character in said characters or in said character
string is located at said position designated at said
position designation step, employing said body
information and said in-body location information to
15 determine the head position of a body that corresponds
to said characters or to said character string, and of
laying out said character string.

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20 133. A graphic processing apparatus comprising:
storage means for storing graphic data to which a
printing attribute has been added;

contour information extraction means for
extracting contour information for said graphic data
based on said printing attribute that has been added to
25 said graphic data stored in said storage means; and

magnification means for performing a magnification
process for said graphic data based on said contour

information extracted by said contour information extraction means.

134. A graphic processing apparatus according to claim 133, further comprising:

magnification designation means for specifying an enlargement size or a reduction size,

wherein, to perform said magnification process, said magnification means calculates a magnification rate based on a size, which is obtained from said contour information extracted by said contour information extraction means, and said enlargement size or said reduction size, which is specified by said magnification designation means.

135. A graphic processing apparatus according to claim 133, further comprising:

graphic pattern designation means for designating a graphic pattern that is to be processed by said contour information extraction means and said magnification means.

136. A graphic processing apparatus according to claim 133, further comprising:

layout means for arranging at a position designated by a user said graphic pattern magnified by said magnification means.

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137. A graphic processing apparatus according to claim 133, further comprising:

instruction saving means for issuing instructions as to whether or not said graphic data changed by said magnification means are to be saved; and

holding means for, when the storage of said graphic data obtained by said magnification means is instructed by said instruction saving means, storing said graphic data on a storage medium as a file.

138. A graphic processing apparatus according to claim 135, wherein said graphic pattern designation means designates, as an object pattern, a desired graphic pattern from among those displayed on a display device.

139. A graphic processing apparatus according to claim 135, wherein said graphic pattern designation means designates a graphic object by specifying a file in a storage device in which graphic data are stored as a file.

140. A graphic processing apparatus according to claim 133, wherein said contour information extraction means includes:

classification means for, in accordance with a printing attribute, sorting said object graphic pattern

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into a first class, including a common pattern such as a single line segment or a circle, a second class, including a multi-line graphic pattern formed of a plurality of lines, or a third class, including a graphic pattern having an offset graphic pattern that differs from the original pattern type; and

extraction means, for extracting said contour information in accordance with said class provided by said classification means.

141. A graphic processing apparatus according to claim 140, wherein, when an object graphic pattern for contour information is sorted to said first class, said extraction means acquires an offset direction, from printing information that is added to said graphic pattern, and performs an offset process to extract the contour of said graphic pattern.

142. A graphic processing apparatus according to claim 140, wherein said extraction means includes:

determination means for, when said graphic object pattern is sorted to said second class, employing said printing information that is added to said object graphic pattern to determine whether connected adjacent lines have a mitered shape and whether an angle at a joint in said mitered shape is greater than a predetermined angle,

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wherein, when said determination means ascertains that said adjacent lines are mitered and that said angle is greater than said predetermined angle, a connection shape for an offset graphic pattern for said adjacent lines is employed as a bevel to extract a contour.

143. A graphic processing apparatus according to claim 142, wherein said extraction means further includes:

means for, when said determination means ascertains that said connected adjacent lines of said graphic object pattern have a mitered shape and that said angle at a joint is equal to or smaller than said predetermined angle, reducing, at an intersection, the length of two intersecting line segments of said offset graphic pattern for said adjacent lines.

144. A graphic processing apparatus according to claim 142, wherein said extraction means further includes:

intersection determination means for, when said determination means ascertains that said adjacent lines of said graphic object pattern are not so connected as to have a mitered shape, determining whether offset line segments, which are obtained from two adjacent line segments of said offset graphic pattern,

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intersect;

means for, when said intersection determination means determines that there is no intersection, extending two unconnected offset line segments until
5 said offset line segments intersect; and

means for, when said intersection determination means determines that there is an intersection, removing a portion that is close to the end from the location at which said offset line segments intersect.

10 145. A graphic processing apparatus according to claim 140, wherein said extraction means further includes:

15 division means for, when said object graphic pattern is sorted to said third class, dividing said object graphic pattern into a plurality of segments; and

20 calculation means for offsetting said segments obtained by said division means and obtaining contour information.

146. A graphic processing apparatus according to claim 145, wherein said division means includes:

25 calculation means for calculating the number for division in consonance with the resolution of an output device; and

recursive division means for recursively dividing

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said object graphic pattern by the number for division obtained by said calculation means,

wherein an approximately linear line that is obtained after said object graphic pattern is divided by said recursive division means is employed as a segment.

147. A graphic processing apparatus according to claim 146, wherein, when said object graphic pattern is a Bezier curve, said recursive division means employs the DeCasteljau algorithm to perform recursive division of said object graphic pattern.

148. A graphic processing apparatus according to claim 147, wherein said calculation means calculates minimum division line length ϵ in accordance with said resolution of said output device; and wherein, when n control points on said Bezier curve are (x_i, y_i) ($i = 0, \dots, n$), said calculation means calculates

$$L0 = \max(|x_i - 2x_{i+1} + x_{i+2}|, |y_i - 2y_{i+1} + y_{i+2}|)$$
$$r0 = \log_4((\sqrt{2n})(n-1)L0/8\epsilon),$$

to obtain $r0$ for said number for division.

149. A graphic processing apparatus according to claim 140, wherein said extraction means includes:

connection shape determination means for determining whether the connection shape of an object

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graphic pattern is round,

wherein, when said connection shape determination means determines that said object graphic pattern is round, said extraction means defines, as a contour pattern, a circle that has, as its center, the coordinates at a joint of an offset graphic pattern, and that has a radius of $1/2$ of a line width.

150. A graphic processing apparatus according to claim 140, wherein said extraction means further includes:

end edge contour shape determination means for identifying an end edge shape of said object graphic pattern and for employing said end edge shape to specify a contour pattern for the end edge of said object graphic pattern.

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151. A graphic processing method comprising:

a storage step of storing in storage means graphic data to which a printing attribute has been added;

a contour information extraction step of extracting contour information for said graphic data based on said printing attribute that has been added to said graphic data stored in said storage means; and

a magnification step of performing a magnification process for said graphic data based on said contour information extracted at said contour information

extraction step.

152. A graphic processing method according to claim 151, further comprising:

5 a magnification designation step of specifying an enlargement size or a reduction size,
wherein, to perform said magnification process, at said magnification step, a magnification rate is calculated based on a size, which is obtained from said
10 contour information extracted at said contour information extraction step, and said enlargement size or said reduction size, which is specified at said magnification designation step.

15 153. A graphic processing method according to claim 151, further comprising:

a graphic pattern designation step of designating a graphic pattern that is to be processed at said contour information extraction step and said
20 magnification step.

154. A graphic processing method according to claim 151, further comprising:

a layout step of arranging at a position
25 designated by a user said graphic pattern magnified at said magnification step.

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155. A graphic processing method according to claim 151, further comprising:

an instruction saving step of issuing instructions as to whether or not said graphic data changed at said magnification step are to be saved; and

a holding step of, when the storage of said graphic data obtained at said magnification step is instructed at said instruction saving step, storing said graphic data on a storage medium as a file.

156. A graphic processing method according to claim 153, wherein at said graphic pattern designation step, a desired graphic pattern is selected, as an object pattern, from among those displayed on a display device.

157. A graphic processing method according to claim 153, wherein at said graphic pattern designation step, a graphic object is designated by specifying a file in a storage device in which graphic data are stored as a file.

158. A graphic processing method according to claim 151, wherein said contour information extraction step includes:

a classification step of, in accordance with a printing attribute, sorting said object graphic pattern

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into a first class, including a common pattern such as a single line segment or a circle, a second class, including a multi-line graphic pattern formed of a plurality of lines, or a third class, including a graphic pattern having an offset graphic pattern that differs from the original pattern type; and

an extraction step of extracting said contour information in accordance with said class provided at said classification step.

159. A graphic processing method according to claim 153, wherein, when an object graphic pattern for contour information is sorted to said first class, at said extraction step, an offset direction is acquired from printing information that is added to said graphic pattern, and an offset process is performed to extract the contour of said graphic pattern.

160. A graphic processing method according to claim 158, wherein said extraction step includes:

a determination step of, when said graphic object pattern is sorted to said second class, employing said printing information that is added to said object graphic pattern to determine whether connected adjacent lines have a mitered shape and whether an angle at a joint in said mitered shape is greater than a predetermined angle,

wherein, when it is ascertained at said determination step that said adjacent lines are mitered and that said angle is greater than said predetermined angle, a connection shape for an offset graphic pattern for said adjacent lines is employed as a bevel to extract a contour.

161. A graphic processing method according to claim 160, wherein said extraction step further includes:

a step of, when it is ascertained at said determination step that said connected adjacent lines of said graphic object pattern have a mitered shape and that said angle at a joint is equal to or smaller than said predetermined angle, reducing, at an intersection, the length of two intersecting line segments of said offset graphic pattern for said adjacent lines.

162. A graphic processing method according to claim 160, wherein said extraction step further includes:

an intersection determination step of, when it is ascertained at said determination step that said adjacent lines of said graphic object pattern are not so connected as to have a mitered shape, determining whether offset line segments, which are obtained from two adjacent line segments of said offset graphic

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pattern, intersect;

a step of, when it is determined at said intersection determination step that there is no intersection, extending two unconnected offset line segments until said offset line segments intersect; and

a step of, when it is determined at said intersection determination step that there is an intersection, removing a portion that is close to the end from the location at which said offset line segments intersect.

163. A graphic processing method according to claim 158, wherein said extraction step further includes:

a division step of, when said object graphic pattern is sorted to said third class, dividing said object graphic pattern into a plurality of segments; and

a calculation step of offsetting said segments obtained at said division step and obtaining contour information.

164. A graphic processing method according to claim 163, wherein said division step includes:

a calculation step of calculating the number for division in consonance with the resolution of an output device; and

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a recursive division step of recursively dividing said object graphic pattern by the number for division obtained at said calculation step,

5 wherein an approximately linear line that is obtained after said object graphic pattern is divided at said recursive division step is employed as a segment.

10 165. A graphic processing method according to claim 164, wherein, when said object graphic pattern is a Bezier curve, at said recursive division step, the DeCasteljau algorithm is employed to perform recursive division of said object graphic pattern.

15 166. A graphic processing method according to claim 165, wherein at said calculation step, minimum division line length ϵ is calculated in accordance with said resolution of said output device; and wherein, when n control points on said Bezier curve are (x_i, y_i)
20 $(i = 0, \dots, n),$

$$L0 = \max(|x_i - 2x_{i+1} + x_{i+2}|, |y_i - 2y_{i+1} + y_{i+2}|)$$

$$r0 = \log_4((\sqrt{2n})(n-1)L0/8\epsilon),$$

are calculated at said calculation step to obtain $r0$ for said number for division.

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167. A graphic processing method according to claim 158, wherein said extraction step includes:

a connection shape determination step of determining whether the connection shape of an object graphic pattern is round,

wherein, when it is determined at said connection shape determination step that said object graphic pattern is round, a circle that has, as its center, the coordinates at a joint of an offset graphic pattern and that has a radius of $1/2$ of a line width is defined as a contour pattern at said extraction step.

168. A graphic processing method according to claim 158, wherein said extraction step further includes:

an end edge contour shape determination step of identifying an end edge shape of said object graphic pattern and of employing said end edge shape to specify a contour pattern for the end edge of said object graphic pattern.

169. A storage medium in which is stored a control program for permitting a computer to perform a graphic process, said control program comprising:

code for a storage step of storing in storage means graphic data to which a printing attribute has been added;

code for a contour information extraction step of extracting contour information for said graphic data

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based on said printing attribute that has been added to
said graphic data stored in said storage means; and

code for a magnification step of performing a
magnification process for said graphic data based on
5 said contour information extracted at said contour
information extraction step.

170. An information processing apparatus
comprising:

10 storage means for storing printing data with added
printing attributes;

contour information extraction means for employing
said printing attributes for said printing data that
are stored in said storage means to extract contour
15 information for said printing data;

layout reference information setting means for
employing said contour information extracted by said
contour information extraction means to set layout
reference information that is to be used as a reference
20 for the layout of said printing data; and

layout means for laying out said printing data
based on said layout reference information determined
by said layout reference information setting means,

wherein, when said printing data is character
25 data, said layout reference information setting means
determines said layout reference information in
accordance with the height of a visible portion of a

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predetermined reference character and the width of a visible portion of said printing data.

171. An information processing apparatus
5 according to claim 170, further comprising:

first character size designation means for
designating the size of character data using said
height of said visible portion of said reference
character that is determined in advance for each
10 typeface.

172. An information processing apparatus
according to claim 171, further comprising:

second character size designation means for
15 designating the size of character data using said
height of a rectangular area that a character occupies.

173. An information processing apparatus
according to claim 172, further comprising:

20 character data size calculation means for
employing the size of said character data designated by
said first or said second character size designation
means to calculate the size of said character data that
is to be designated by the other character size
25 designation means, so all of said character data that
are prepared have the same size, regardless of whether
said first or said second character size designation

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means is employed to designate the size of said character data.

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174. An information processing apparatus
5 according to claim 170, wherein said layout reference
information determined by said layout reference
information setting means is a feature point on a
character string layout reference rectangle that is
determined by using said height of said visible portion
10 of said predetermined reference character and said
width of said visible portion of said character, and
wherein said layout position specified by said
layout means is a designated point on a display screen,
or an input coordinate position.

15
175. An information processing apparatus
according to claim 174, further comprising:

20 full width character string designation means for
specifying the width of said character string layout
reference rectangle; and

first full width character string control means
for adjusting the size of character data, so that the
width of a character layout reference rectangle for
said character data matches a full width character
25 string specified by said character string designation
means.

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176. An information processing apparatus
according to claim 174, further comprising:

full width character string designation means for
specifying the width of said character string layout
5 reference rectangle; and

second full width character string control means
for adjusting character spacing for character data, so
that the width of a character layout reference
rectangle for said character data matches a full width
10 character string specified by said full width character
string designation means, and so that said height of
said character string layout reference rectangle is
unchanged.

177. An information processing apparatus
according to claim 174, further comprising:

full width character string designation means for
specifying the width of said character string layout
reference rectangle; and

20 second full width character string control means
for adjusting a vertical scale for character data, so
that the width of a character layout reference
rectangle for said character data matches a full width
character string specified by said full width character
25 string designation means, and so that said height of
said character string layout reference rectangle is
unchanged.

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178. An information processing apparatus according to claim 170, wherein said layout reference information determined by said layout reference information setting means is a character layout
5 reference rectangle that is determined by the height of a visible portion of a predetermined reference character and the width of a visible portion of character data; and

wherein said layout position specified by said
10 layout means is a rectangular designated area on a display screen.

179. An information processing apparatus according to claim 178, further comprising:

15 automatic entering means for, in order to lay out character data wherein the width of said character layout reference rectangle is larger than the width of said rectangular area on said display screen, inserting a line change command into an adequate position in said
20 character data so that said width of said character data does not exceed said width of said designated rectangular area on said display screen.

180. An information processing apparatus
25 according to claim 178, further comprising:

rectangular area left justification means for aligning the left side of said character string layout

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reference rectangle with the left side of said rectangular area that is designated as said layout position;

5 rectangular area right justification means for aligning the right side of said character string layout reference rectangle with the right side of said rectangular area that is designated as said layout position;

10 rectangular area center justification means for centering said character string layout reference rectangle between the left and right margins of said rectangular area that is designated as said layout position; and

15 rectangular area full justification means for aligning the respective sides of said character string layout reference rectangle with the corresponding respective sides of said rectangular area that is designated as said layout position.

20 181. An information processing apparatus according to claim 170, further comprising:

25 character spacing kerning setting means for adjusting, in a line feed direction or a character feed direction, relative output positions of two arbitrary adjacent characters in the same character data line that consists of a plurality of characters.

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182. An information processing apparatus
according to claim 181, wherein said character interval
kerning setting means designates the adjustment value
for an output position for a character in said
5 character feed direction by employing a parameter that
is based on the height of a visible portion of a
reference character that is defined in advance for each
typeface, and a vertical scale that constitutes an
enlargement rate for a character in said character feed
10 direction; and wherein said character interval kerning
setting means designates an adjustment value for an
output position for a character in said line feed
direction by employing the height of a visible portion
of a reference character, which is defined in advance
15 for each typeface, and a parameter that is based on a
horizontal scale that constitutes an enlargement rate
for a character in said line feed direction.

183. An information processing apparatus
20 according to claim 182, further comprising:

storage means;

character spacing automatic kerning storage means
for setting, in advance for each typeface, character
spacing kerning data for the distance between two
25 designated characters, or character spacing kerning
data for the distance before and after a specific
character, and for storing said kerning distance in

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said storage means;

character spacing automatic kerning retrieval
determination means for determining whether or not said
character spacing automatic kerning data that is stored
5 by said character spacing automatic kerning storage
means is effective; and

character spacing automatic kerning retrieval
means for, when said character spacing automatic
kerning retrieval determination means ascertains that
10 said character spacing automatic kerning data are
effective, retrieving said character spacing automatic
kerning data from said storage means and for reflecting
said character spacing automatic kerning data in
character data.

15 184. An information processing apparatus
according to claim 170, further comprising:

line spacing kerning setting means for adjusting,
in a line feed direction, relative output positions of
20 two arbitrary adjacent lines of character data
consisting of a plurality of lines.

25 185. An information processing apparatus
according to claim 184, wherein said line spacing
kerning setting means designates an adjustment value
for an output position for a character in said line
feed direction by using the height of a visible portion

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of a reference character that is defined in advance for each typeface and a parameter that is based on a horizontal scale that constitutes an enlargement rate for a character in said line feed direction.

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186. An information processing apparatus according to claim 170, further comprising:

10 typeface information control character string input means for inserting, into character data, a character or a character string for controlling typeface information for said character data; and

15 typeface information control means for changing typeface information in said same character data in accordance with said character or said character string that is entered by said typeface information control character string input means.

187. An information processing apparatus according to claim 186, further comprising:

20 typeface information control character string display means provided in order to identify said character or said character string that is entered by said typeface information control character string input means.

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188. An information processing apparatus according to claim 186, further comprising:

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storage means; and
character data registration means for storing in
said storage means, together with character string
information, said typeface information for said
5 character data.

189. An information processing apparatus
according to claim 188, further comprising:

10 registered character data display means for
displaying on a screen a list of names of character
data that have been registered by said character data
registration means;

15 registered character data designation means for
designating by name character data that are to be
retrieved by using said list of names of character data
that is displayed by said registered character data
display means;

20 registered character data retrieval means for
retrieving from said storage means said registered
character data that is specified by said registered
character data designation means;

25 character string information extraction means for
employing said registered character data that is
retrieved by said registered character data retrieval
means to determine whether character string information
other than said typeface information is to be
extracted; and

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character string information extraction means for,
when said character string information retrieval
selection means determines that said character string
information is to be extracted, extracting character
5 string information, other than that for said typeface
information, from said registered character data that
is retrieved by said registered character data
retrieval means.

10 190. An information processing apparatus
according to claim 170, further comprising:

display means for displaying printing data on a
screen;

15 designation means for designating on said screen
said printing data that have been laid out by said
layout means;

20 layout object determination means for, when said
printing data specified by said designation means is
character data, determining whether a layout position
determined by said layout means is a designated point
on said screen or a coordinate position entered on said
screen, or a designated rectangular area on said
screen; and

25 layout object display means for displaying on said
screen the results obtained by said layout object
determination means.

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191. An information processing apparatus
according to claim 170, further comprising:

display means for displaying printing data on a
screen;

5 designation means for designating on said screen
said printing data that have been laid out by said
layout means;

character string layout reference information
display means for, when said printing data specified by
10 said designation means is character data, defining said
layout reference information as the height and the
width of a character string layout reference rectangle
that is determined by the height of a visible portion
of a predetermined reference character and the width of
15 a visible portion of character data, and for displaying
said layout reference information on said screen; and

character layout reference information calculation
means for re-calculating said height and said width of
said character string layout reference rectangle that
20 is obtained as a result of the editing of said typeface
information for said character data.

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192. An information processing method comprising:
a contour information extraction step of employing
25 printing attributes for printing data to extract
contour information for said printing data;

a layout reference information setting step of

employing said contour information extracted at said contour information extraction step to set layout reference information that is to be used as a reference for the layout of said printing data; and

5 a layout step of laying out said printing data based on said layout reference information determined at said layout reference information setting step,

 wherein, when said printing data is character data, it is determined at said layout reference
10 information setting step said layout reference information in accordance with the height of a visible portion of a predetermined reference character and the width of a visible portion of said printing data.

15 193. An information processing method according to claim 192, further comprising:

 a first character size designation step of designating the size of character data using said height of said visible portion of said reference
20 character that is determined in advance for each typeface.

 194. An information processing method according to claim 192, further comprising:

25 a second character size designation step of designating the size of character data using said height of a rectangular area that a character occupies.

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195. An information processing method according to claim 194, further comprising:

a character data size calculation step of employing the size of said character data designated at said first or said second character size designation step to calculate the size of said character data that is to be designated at the other character size designation step, so all of said character data that are prepared have the same size, regardless of whether said first or said second character size designation step is performed to designate the size of said character data.

196. An information processing method according to claim 192, wherein said layout reference information determined at said layout reference information setting step is a feature point on a character string layout reference rectangle that is determined by using said height of said visible portion of said predetermined reference character and said width of said visible portion of said character, and

wherein said layout position specified at said layout step is a designated point on a display screen, or an input coordinate position.

197. An information processing method according to claim 196, further comprising:

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a full width character string designation step of specifying the width of said character string layout reference rectangle; and

5 a first full width character string control step of adjusting the size of character data, so that the width of a character layout reference rectangle for said character data matches a full width character string specified at said character string designation step.

10 198. An information processing method according to claim 196, further comprising:

15 a full width character string designation step of specifying the width of said character string layout reference rectangle; and

a second full width character string control step of adjusting character spacing for character data, so that the width of a character layout reference rectangle for said character data matches a full width character string specified at said full width character string designation step, and so that said height of said character string layout reference rectangle is unchanged.

25 199. An information processing method according to claim 196, further comprising:

a full width character string designation step of

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specifying the width of said character string layout
reference rectangle; and

a second full width character string control step
of adjusting a vertical scale for character data, so
5 that the width of a character layout reference
rectangle for said character data matches a full width
character string specified at said full width character
string designation step, and so that said height of
said character string layout reference rectangle is
10 unchanged.

200. An information processing method according
to claim 192, wherein said layout reference information
determined at said layout reference information setting
15 step is a character layout reference rectangle that is
determined by the height of a visible portion of a
predetermined reference character and the width of a
visible portion of character data; and

wherein said layout position specified at said
20 layout step is a rectangular designated area on a
display screen.

201. An information processing method according
to claim 200, further comprising:

25 an automatic entering step of, in order to lay out
character data wherein the width of said character
layout reference rectangle is larger than the width of

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a rectangular area full justification step of aligning the respective sides of said character string layout reference rectangle with the corresponding respective sides of said rectangular area that is

designated as said layout position.

203. An information processing method according to claim 192, further comprising:

5 a character spacing kerning setting step of adjusting, in a line feed direction or a character feed direction, relative output positions of two arbitrary adjacent characters in the same character data line that consists of a plurality of characters.

10 204. An information processing method according to claim 203, wherein at said character interval kerning setting step, the adjustment value for an output position for a character in said character feed direction is designated by employing a parameter that is based on the height of a visible portion of a reference character that is defined in advance for each typeface, and a vertical scale that constitutes an enlargement rate for a character in said character feed direction; and wherein at said character interval kerning setting step, an adjustment value for an output position for a character in said line feed direction is designated by employing the height of a visible portion of a reference character, which is defined in advance for each typeface, and a parameter that is based on a horizontal scale that constitutes an enlargement rate for a character in said line feed direction.

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205. An information processing method according to claim 204, further comprising:

a character spacing automatic kerning storage step of setting, in advance for each typeface, character spacing kerning data for the distance between two designated characters, or character spacing kerning data for the distance before and after a specific character, and of storing said kerning distance in storage means;

a character spacing automatic kerning retrieval determination step of determining whether or not said character spacing automatic kerning data that is stored at said character spacing automatic kerning storage step is effective; and

a character spacing automatic kerning retrieval step of, when it is ascertained at said character spacing automatic kerning retrieval determination step that said character spacing automatic kerning data are effective, retrieving said character spacing automatic kerning data from said storage means, and of reflecting said character spacing automatic kerning data in character data.

206. An information processing method according to claim 192, further comprising:

a line spacing kerning setting step of adjusting, in a line feed direction, relative output positions of

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two arbitrary adjacent lines of character data
consisting of a plurality of lines.

207. An information processing method according
to claim 206, wherein at said line spacing kerning
setting step, an adjustment value for an output
position for a character in said line feed direction is
designated by using the height of a visible portion of
a reference character that is defined in advance for
each typeface and a parameter that is based on a
horizontal scale that constitutes an enlargement rate
for a character in said line feed direction.

208. An information processing method according
to claim 192, further comprising:

a typeface information control character string
input step of inserting, into character data, a
character or a character string for controlling
typeface information for said character data; and

a typeface information control step of changing
typeface information in said same character data in
accordance with said character or said character string
that is entered at said typeface information control
character string input step.

209. An information processing method according
to claim 208, further comprising:

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5 a typeface information control character string
display step provided in order to identify said
character or said character string that is entered at
said typeface information control character string
input step.

210. An information processing method according
to claim 208, further comprising:

10 a character data registration step of storing in
storage means, together with character string
information, said typeface information for said
character data.

15 211. An information processing method according
to claim 210, further comprising:

a registered character data display step of
displaying on a screen a list of names of character
data that have been registered at said character data
registration step;

20 a registered character data designation step of
designating by name character data that are to be
retrieved by using said list of names of character data
that is displayed at said registered character data
display step;

25 a registered character data retrieval step of
retrieving said registered character data that is
specified at said registered character data designation

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step;

a character string information extraction step of
employing said registered character data that is
retrieved at said registered character data retrieval
5 step to determine whether character string information
other than said typeface information is to be
extracted; and

a character string information extraction step of,
when it is determined at said character string
10 information retrieval selection step that said
character string information is to be extracted,
extracting character string information, other than
that for said typeface information, from said
registered character data that is retrieved at said
15 registered character data retrieval step.

212. An information processing method according
to claim 192, further comprising:

a display step of displaying printing data on a
20 screen;

a designation step of designating on said screen
said printing data that have been laid out at said
layout step;

a layout object determination step of, when said
25 printing data specified at said designation step is
character data, determining whether a layout position
determined at said layout step is a designated point on

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said screen or a coordinate position entered on said screen, or a designated rectangular area on said screen; and

5 a layout object display step of displaying on said screen the results obtained at said layout object determination step.

213. An information processing method according to claim 192, further comprising:

10 a display step of displaying printing data on a screen;

a designation step of designating on said screen said printing data that have been laid out at said layout step;

15 a character string layout reference information display step of, when said printing data specified at said designation step is character data, defining said layout reference information as the height and the width of a character string layout reference rectangle that is determined by the height of a visible portion of a predetermined reference character and the width of a visible portion of character data, and of displaying said layout reference information on said screen; and

25 a character layout reference information calculation step of re-calculating said height and said width of said character string layout reference rectangle that is obtained as a result of the editing

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of said typeface information for said character data.

214. A storage medium in which a computer program is stored, said computer program comprising:

5 a first module for employing printing attributes that are added to printing data to extract contour information for said printing data;

10 a second module for, when said printing data is character data, employing the height of a visible portion of a predetermined reference character, the width of a visible portion of said printing data, and said extracted contour information to set layout reference information that is used as a reference for the layout of said printing data; and

15 a third module for laying out said printing data based on said layout reference information that is obtained.

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